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Method for the remediation of organoleads especially tetraethyllead (TEL) in contaminated natural media

Description of Technology: In contaminated media, transformation of organoleads, especially tetraethyllead, into inorganic form is achieved by stimulation of indigenous microbial populations. Complex biological extracts and other nutrient amendments promote microbial activity under aerobic or anaerobic conditions. Under anaerobic conditions, sulfide production by sulfate reducing bacteria is especially promoted. Transformation to the inorganic form reduces lead toxicity and mobility in ground water supplies.

Patent Listing:

1. **US Patent No.** 5,656,489, Issued on August 12, 1997, "Method for the remediation of organoleads especially tetraethyllead (TEL) in contaminated natural media."
   http://patft.uspto.gov/netacgi/nph-Parser?Sect1=PTO2&Sect2=HITOFF&p=1&u=%2Fnetahtml%2FPTO%2Fsearch-bool.html&r=1&f=G&l=50&co1=AND&d=PTXT&s1=5,656,489.PN.&OS=PN/5,656,489&RS=PN/5,656,489

Market Potential: Handling practices at some manufacturing facilities have resulted in soil and ground water contamination by TEL and other alkyl leads. These compounds are highly toxic to the environment and detrimental to human health. TEL causes serious human health effects at doses of less than 10 mg/kg body weight and many TEL decomposition products (e.g., triethyl lead chloride) are also known to be toxic to humans. Many decomposition products are also quite water soluble making it possible for them to be carried long distances in ground water. Because many of the inorganic lead salts resulting from complete decomposition of TEL are relatively insoluble in water, inorganic lead (elemental symbol=Pb) has been identified as one of the more desirable decomposition products with regard to reducing soluble lead levels in the contaminated ground water. Organometals such as TEL generally show higher environmental mobility and/or greater toxicity than inorganic forms. It is environmentally beneficial to transform these organometals into their inorganic forms in order to prevent contamination of water supplies. Thus, the present invention provides a process whereby toxic compounds, and specifically organolead such as TEL, are converted to inorganic species via stimulation of the indigenous microbial population of the contaminated area. The three main competitors in the water services market are California Water Services Group, American States Water Co., and American Water Works. California Water Services Group had $26 million in net profit in 2004. American States Water Co. had a net profit of $18.5 million in 2004. American Water Works serves 20 million people in the US and Canada.

Benefits:

- Organoleads such as TEL are converted to a much safe inorganic species.
- Reduction in lead toxicity and mobility in ground water supplies.

Applications:

- Remediate soil and ground water containing toxic chemicals.